B

NOTE ON THE AUTECOLOGY OF THE HERMIT CRAB PAGURISTES OCULATUS

Zdravko STEVCIC

Center for Marine Research, Rudjer Boskovic Institute, Rovinj (Yugoslavia)

RESUME

Quelques données sur l'autoécologie du Pagure ermite Paguristes oculatus observé dans la baie de Salina, à l'embouchure du canal Limski, près de Rovinj, sur une prairie à Zostera marina entre un et quatre mètres de profondeur sont fournies.

The hermit crab *Paguristes oculatus* (Fabricius, 1775) (Crustacea Decapoda, Diogenidae) is one of the most common hermit crabs in the Adriatic Sea, but nevertheless, its ecology is very poorly known. Since it was regularly sampled during the investigations of the decapod fauna of the Saline Bay, the material permits a review of its ecology.

Locality and collecting. The hermit crab was investigated in the Saline Bay (mouth of Limski kanal) near Rovinj, northern Adriatic Sea). The field collections were made about every month from October 1981 to November 1982. It was sampled by "musular" (a local type of dredge, similar to a beam trawl). The results of sampling are presented in the following table.

Date	Sex: Male	Sex: Female (Ovig.)	Total	Gastropod Shells: Gourmya	Others
13.10.1981	-	3 (0)	3	2	1
21.11.1981	7	4 (0)	11	9	2
04.01.1982	11	13 (0)	24	24	-
10.02.1982	8	6 (2)	14	13	1
17.03.1982	9	7 (0)	16	15	1
20.04.1982	20	13 (3)	33	33	-
18.05.1982	14	18 (9)	32	32	-
18.06.1982	15	14 (11)	29	24	5
20.07.1982	13	10 (8)	23	22	1
17.08.1982	8	8 (6)	16	15	1
16.09.1982	18	15 (0)	33	32	1
13.10.1982	1	4 (0)	5	4	1
19.11.1982	2	4 (0)	6	6	-
Total	126	119	245	231	14

Habitat. *Paguristes oculatus* was sampled in the *Zostera marina* meadow in shallow water, between 1 and 4 meters in depth. The flora and fauna of the Salina Bay were very rich and abundant as usual in such a sea grass community. In samples examined in 1985 and 1986 it has become clear that *Zostera* was declining in abundance in the Bay.

Population structure. The hermit crab was captured throughout the sampling period.The sex ratio males/females was 1.05. All observed specimens had the left cheliped as the major one. This species, as shown by the above table, usually inhabits the shells of *Gourmya vulgata* (= *Cerithium vulgatum*). Other snail specier were: *Murex brandaris* (9 times), *Murex* sp. (1), *Trunculariopsis trunculus* (1), *Hinia* sp. (1), *Fusinus* sp. (1) and *Ceratosoma erinaceum* (1).

Reproductive period. Ovigerous females were observed from February to August. The eggs are at the outset orange, later red and at the end they exhibit dark spots (= eyes). The first hatching period is in June and females have at least two broods per year, perhaps three.

Nutrition. The stomach contents were examined in the laboratory. Empty stomachs predominated (127 from 245) and completely full stomachs or even more than 80% of fullness were not recorded. Concerning the composition of the stomach contents, the most frequent were sand particles (89 times), thereafter fine organic particles, probably detritus (68), indicating that they are the substrate for the crabs' food. Small organic particles, more or less compact, but of unknown origin were founf 46 times,the reafter various algae (24), unidentified higher vascular plants (15), decapod Natantia and Polychaetes (2), whereas snail, bivalve and foraminifer occurred only once. Consequently the diet consists of very limited food items.

Symbionts. The snail shells were usually without macroscopic epibionts. Only three times *Calliactis parasitica* was observed, and sometimes the green alga *Dasycladus clavaeformis*, thereafter *Anomia ephippium* (7 times), and *Salmacina* sp. (1). On the body of the crabs *Peltogaster* sp. was observed and in the body parasitic Nematodes (1).

Discussion. *Paguristes oculatus* is very common throughout the Rovinj area, but usually in deeper water and inhabiting shells of various Muricidae. In Saline Bay it occurs in very shallow water and predominantly in *Gourmya* shells. As mentioned by Stachowitsch (1980), this species may inhabit shells of 3-4 snail species before reaching maximal size, but as shown here, it can reach sexual maturity in shells of *Gourmya*, although its later destiny is not known.

REFERENCES

STACHOWITSCH - 1980 - Marine Ecology 1:73-101, p. 76.

RELATION TAILLE-POIDS EN RELATION AVEC LES ÉTATS DE MUE ET SEXUELS CHEZ LE BRACHYOURE LIOCARCINUS DEPURATOR

Pere ABELLÓ

Instituto de Ciencias del Mar, Passeig Nacional s/n, Barcelona (Espana)

ABSTRACT

Length-weight relationships for male and female Liocarcinus depurator, a brachyuran crab, according to moult stage and gonadic development are presented in this paper. Significant differences between intermoult and postmoult individuals and among the different stages of ovarian development in females are found.

Le but de ce papier est de présenter les relations taille-poids du brachyoure Liocarcinus depurator (L.) par sexe, état de mue et état sexuel. Olmi & Bishop (1983) et Cadman & Weinstein (1985) font une approche similaire à ce thème, chez le brachyoure Callinectes sapidus.

Les populations de L. depurator du plateau continental proche de Barcelona (NW de la Méditerranée) ont été échantillonnées. Le sexe, la longueur de la carapace, en mm (avec une précision de 0.1 mm), le poids frais (avec une précision de 0.1 g), l'état de mue et l'état sexuel ont été notés. On a calculé la relation taille-poids, en accord avec le modèle potentiel ($y = a\,x^b$), séparément par sexe et état de mue et, chez les femelles en intermue, selon l'état sexuel.

Les états de mue pris en considération sont: post-écdyse (état 3), post-écdyse avancée (état 4), intermue (état 5) et pre-écdyse (état 6). Les états sexuels pris en considération chez les femelles sont: immatures (état 1), début de maturation (état 2), mûres (états 3 et 4) et ovigères. Chez les mâles on n'a pas pris en considération l'état sexuel, étant donné que leur cycle sexuel n'implique pratiquement pas de changement de poids.

On présente au tableau 1 les valeurs des paramètres des équations potentielles obtenues.

Tableau 1

équation	a	b	var b	n	r
1 Mâles mue 3	$0{,}3616 \cdot 10^{-3}$	3,0994	$0{,}1409 \cdot 10^{-1}$	45	0,9699
2 Mâles mue 4	$0{,}5481 \cdot 10^{-3}$	3,0095	$0{,}4943 \cdot 10^{-2}$	71	0,9817
3 Mâles mue 5	$0{,}6050 \cdot 10^{-3}$	2,9956	$0{,}4103 \cdot 10^{-3}$	684	0,9848
4 Femelles mue 3	$0{,}3666 \cdot 10^{-2}$	2,3866	$0{,}5518 \cdot 10^{-1}$	52	0,8208
5 Femelles mue 4	$0{,}1090 \cdot 10^{-2}$	2,7749	$0{,}7061 \cdot 10^{-2}$	86	0,9636
6 Femelles inactives	$0{,}4452 \cdot 10^{-3}$	3,0723	$0{,}1170 \cdot 10^{-2}$	321	0,9808
7 Femelles mûres	$0{,}6709 \cdot 10^{-3}$	2,9592	$0{,}1113 \cdot 10^{-2}$	250	0,9846
8 Femelles ovigères	$0{,}6335 \cdot 10^{-3}$	3,0107	$0{,}2076 \cdot 10^{-2}$	295	0,9680

On a comparé à l'aide de tests t les différentes équations obtenues pour mettre en évidence l'existence de différences significatives entre les différentes équations. Chez les mâles (fig.1), on détecte des différences significatives entre les états de post-écdyse et d'intermue. Chez les femelles (figs. 2 et 3), toutes les rélations calculées en prenant en considération les états de mue et sexuels sont significativement différentes, hormis les deux états de post-écdyse et des femelles mûres et ovigères.

Toutes les différences observées ont un sens physiologique, étant donné que les processus du cycle de mue genèrent des différences dans le poids de l'animal. Aussi, chez les femelles, les processus de maturation ovarienne genèrent une augmentation sensible dans le poids des animaux.

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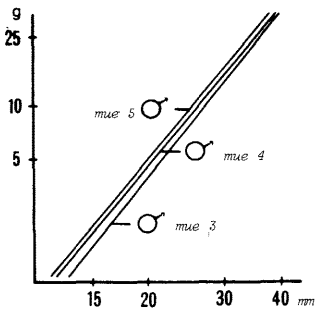

Fig. 1

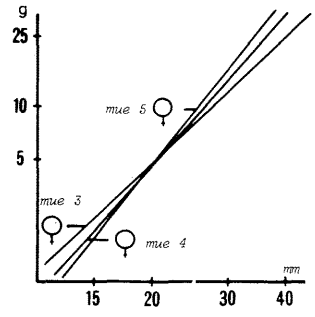

Fig. 2

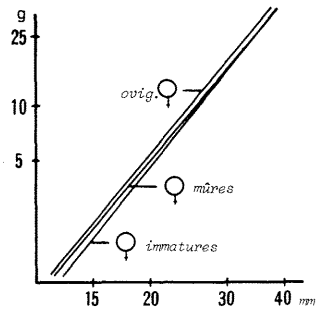

Fig. 3